

1 TITLE OF THE INVENTION

2 Expandable Fire-Fighting Fluid Container

3 APPLICANT

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5 BACKGROUND OF THE INVENTION

6 1. Field of the Invention:

7 This invention relates generally to portable fire-fighting devices for fighting fires in remote
8 locations.

9 2. Prior Art:

10 In the fight against wild fires, firefighters are supplied with portable water tanks transported by
11 truck or helicopter. The tanks are usually filled by helicopter at the fire site. The equipment for
12 pumping water from the tanks, such as engine-driven pumps, hoses, etc., are usually ordered as
13 necessary and transported separately from the tanks. Due to logistical difficulties in the
14 transmission and filling of such orders, the tanks and associated equipment often arrive at widely
15 different times, so that the fire fighting effort is significantly delayed. Even when the all the
16 pieces are gathered, they are time consuming to assemble and connect together. Further, the
17 water tanks are limited to a maximum width of 8 feet for being towed on standard roads. The
18 width limit thus limits the maximum water capacity.

OBJECTS OF THE INVENTION

Accordingly, objects of the present fire-fighting container are:

- to be transportable by wheeled vehicle or helicopter to a fire at any location;
- to be easily refillable by helicopter or a nearby water source for prolonged operation;
- to be fully self-contained with all the necessary equipment;
- to be compactable for being towed on roads; and
- to be expandable at the fire site for increasing water capacity.

Further objects of the present invention will become apparent from a consideration of the drawings and ensuing description.

BRIEF SUMMARY OF THE INVENTION

An expandable fire-fighting fluid container is arranged for receiving a fire fighting fluid. The container is comprised of end walls, a bottom between the end walls, and movable side walls connected to the end walls and the bottom with expandable seals. Actuators are attached between the side walls and the end walls. The actuators are powered by an engine attached to the container. The side walls are retractable inward for reducing container width for traveling on public roads, and expandable outward for increasing fluid capacity at a fire site. A pump is attached to the container for pumping the fluid to douse a fire.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

Fig. 1 is an end sectional view of the present expandable fire-fighting fluid container in a compacted condition.

Fig. 2 is an end sectional view thereof in an expanded condition.

1 Fig. 3 is an end sectional view of an alternative embodiment thereof in a compacted condition.

2 Fig. 4 is an end sectional view of the embodiment of Fig. 3 in an expanded condition.

3 Fig. 5 is a schematic thereof.

4 DRAWING REFERENCE NUMERALS

5	10. Container	11. End Wall
6	12. Bottom	13. Side Wall
7	14. Expandable Seal	15. Actuator
8	16. Compartment	17. Vertical Plate
9	18. Horizontal Plate	19. Bellows
10	20. Engine	21. Pump
11	22. Valve	23. Foam Tank
12	24. Foam Proportioner	25. Pump
13	26. Leveling System	27. Air Compressor
14	28. Pontoons	

15 DETAILED DESCRIPTION OF THE INVENTION

16 Figs. 1-2:

17 An expandable fire-fighting fluid container 10 is shown in an end sectional view in Fig. 1.

18 Container 10 includes end walls 11 (one shown), a bottom 12 between end walls 11, and
19 movable side walls 13 between end walls 11. End walls 11 are preferably fixedly attached to
20 bottom 12. Side walls 13 are connected to end walls 11 and bottom 12 with expandable seals 14.
21 Actuators 15 are attached between side walls 13 and end walls 11. Container 10 is rectangular in

1 this example, but it may be of another shape. There may be any number of actuators 15, which
2 are powered by an engine in an equipment compartment 16 in container 10. In this example,
3 actuators 15 are comprised of hydraulic jacks, but they may be another type of actuator, such as
4 electric actuators. Side walls 13 are expandable outward by actuators 15 for increasing fluid
5 capacity, and retractable inward for reducing container width for traveling on public roads.

6 In this example, expandable seal 14 is comprised of sliding vertical plates 17 (one shown) which
7 are fixed to the ends of side walls 13 and movably positioned flat against respective end walls
8 11, and a sliding horizontal plate 18 which is fixed to the bottom of side wall 13 and movably
9 positioned flat against bottom 12. Side walls 13 are shown in Fig. 1 retracted for minimizing the
10 width of container 10. Vertical plates 17 and horizontal plate 18 are slid inward when side walls
11 13 are retracted. The compacted width of container 10 is preferably about 8 feet for being towed
12 on public roads. As shown in Fig. 2, actuators 15 are operable to move side walls 13 outward for
13 increasing the fluid capacity of container 10. The maximum expanded width of container 10 is
14 preferably about 12 feet. Alternatively, container 10 may have different retracted and expanded
15 dimensions.

16 Container 10 may be compacted for transport to a fire site by road, and place on the ground for
17 receiving water sucked from a nearby water source or dropped from a helicopter through its open
18 top for fire fighting. Side walls 13 may be expanded for increasing fluid capacity.

19 Figs. 3-4:

20 An alternative embodiment of the expandable seal is comprised of a flexible bellows 19 with an
21 outer edge attached to side walls 13, and an inner edge attached to end walls 11 and bottom 12.
22 Bellows 19 is lengthened when side walls 13 are moved outward, and shortened when side walls
23 13 are moved inward.

1 Fig. 5:

2 An engine 20 and a pump 21 are positioned inside the equipment compartment. Pump 21 is
3 driven by engine 20, and is connected to a suction/discharge valve 22 for sucking water from a
4 nearby water source to fill the container 10, or discharging the water stored in the container for
5 dousing a fire. A fire-retardant foam tank 23 is connected to a foam proportioner 24, which is
6 also connected to valve 22. A hydraulic pump 25 powered by engine 20 is connected to actuators
7 15 for extending the side walls. Alternatively, actuators 15 may be electrically powered by a
8 battery or generator. Hydraulic pump 25 is also connected to a leveling system 26, such as
9 vertical jacks, for stably positioning the container on uneven ground. An air compressor 27
10 powered by engine 20 is connected to inflatable pontoons 28 attached to the container for
11 floatation.

12 Although the above description is specific, it should not be considered as a limitation on the
13 scope of the invention, but only as an example of the preferred embodiment. Many variations are
14 possible within the teachings of the invention. For example, wheels may be added for towing
15 behind a vehicle. Therefore, the scope of the invention should be determined by the appended
16 claims and their legal equivalents, not by the examples given.